

along the transatlantic steamer routes, those of the second and third decades of the month being particularly severe. Several storms of marked strength visited the Great Lakes during the first and second decades, those of the 7th to 9th, and 11-12th being the most important. The steamship *Arcadia* left the port of Manistee the afternoon of the 12th while storm warnings were displayed and was lost with all on board. The severest storm of the month on the North Pacific coast occurred on the 5th when the wind reached a velocity of 85 miles an hour from the southeast at North Head, Wash.

About 1 a. m. of the 5th a tornado past thru the northern portion of Alexandria, La., killing several persons, wrecking many houses, and overturning an empty passenger train. This storm was apparently one of a group of several severe local storms that visited parts of central and southern Louisiana and southern Mississippi, causing, so far as can be learned, a loss of 15 to 20 human lives, and property destruction aggregating several hundred thousand dollars.

BOSTON FORECAST DISTRICT.

The average temperature for New England was the lowest recorded for April during the last eighteen years. Precipitation was in excess, except in Connecticut. From the 8th to the 10th snow fell to depths that varied from 6 inches on the coast to from 12 to 18 inches in the interior. Attending this snowstorm was one of the severest gales of the season. Timely warnings were issued for the storm, and so far as known, there was no damage to shipping or loss of life.—*J. W. Smith, District Forecaster.*

NEW ORLEANS FORECAST DISTRICT.—*Not received.*

LOUISVILLE FORECAST DISTRICT.

The month was the coldest April during the period of Weather Bureau observations. Freezing temperatures and frosts were of frequent occurrence. Snow fell over a large portion of Kentucky and Tennessee on the 9th, 10th, and 13th. A severe thundersquall, with heavy hail and a maximum wind velocity of 52 miles an hour, visited Louisville the afternoon of the 7th. Warnings issued in connection with frosts were justified.—*F. J. Walz, District Forecaster.*

CHICAGO FORECAST DISTRICT.

The month was marked by unusual cold over the entire district. Open ports on Lake Michigan were advised regarding storms of the first decade of the month. The display of storm warnings on the Great Lakes was resumed for the season on the 10th. Storm warnings were ordered for the upper Lakes the night of the 11th and on the morning of the 12th. The steamship *Arcadia*, that left Manistee the afternoon of the 12th while the storm warnings were flying, foundered on Lake Michigan and was lost with all on board. Storm warnings were again hoisted on the 15th and 24th.—*H. J. Cox, Professor and District Forecaster.*

DENVER FORECAST DISTRICT.

During the first half of the month temperatures were generally above the seasonal average. During the latter half cold was marked and prolonged on the eastern slope of the Rocky Mountains, and in the eastern counties of Colorado the average temperatures for the month were the lowest in twenty years. Frosts and freezing temperatures, for which warnings were issued, occurred, except in southern Arizona. Precipitation was deficient, except in eastern and southwestern Colorado and northern New Mexico. Exceptionally heavy snow occurred on the 19th and 20th.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

The month was on the whole quiet, with unusually light rainfalls. The depressions that appeared were of moderate intensity. No storm or frost warnings were issued.—*A. G. McAdie, Professor and District Forecaster.*

PORTLAND, OREG., FORECAST DISTRICT.

Nearly all the precipitation of the month fell from the 4th to the 6th, and on the 9th and 10th. The rains of the first period were attended by severe gales and by a bank-full stage of water in the Willamette River at Portland. After the 10th the weather was dry, with cool nights and frequent frosts the occurrence of which in nearly every instance was forecast twenty-four hours in advance.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

The crest of the March flood past Memphis on March 30 and 31, and reached the mouth of the river about the middle of April. Stages were, as a rule, somewhat above flood heights, but no damage has been reported.

Warnings giving the time and height of the flood crest were issued from five to twelve days in advance, and the difference between the forecast and the actual stages averaged but a few tenths of a foot.

There was also some moderately high water in the upper Mississippi River due to the run-off from the melting of the accumulated winter snows in Minnesota and Wisconsin. Flood stages were not quite reached, except at Leclaire, Iowa, and Hannibal, Mo., where they were slightly exceeded.

Warnings of the flood were issued in the Davenport, Iowa, district, which extends from just below Dubuque to Davenport. They were nearly a week in advance of the flood, and the final warnings, from three to five days in advance of the crest, were correct to within 0.2 foot. There was very little flooding, property in danger from seepage water was removed, and the damage was comparatively trifling.

Warnings for the flood in the vicinity of Hannibal were also very accurate. Some unprotected lowlands were overflowed, but no material damage resulted.

The Ohio River fell steadily without special incident, while the Missouri River changed but little.

Navigation opened for the season at Dubuque, Iowa, on the 1st, and at St. Paul on the 19th.

The abnormally high temperatures of the closing days of March caused a rapid melting of the remaining snow and ice in the upper Connecticut Valley, and warnings were issued on March 30 for the flood stage of 16 feet at Hartford, Conn., on the following day. The flood wave, however, was delayed somewhat, and the crest stage of 16 feet was not reached until the morning of April 1.

There were no other high waters, except in the lower Red River of the North, where the usual flood stages incident to the breaking up of the ice in the spring were experienced. Warnings for the river north of Moorhead, Minn., were first issued on March 27, and repeated almost daily until April 15. The highest stage reached at Moorhead was 29.8 feet, on March 30 and 31, 3.8 feet above the flood stage, and at Drayton, N. Dak., about 34 feet on April 15.

No ice was observed in the Missouri River below the mouth of the James River, and all above had disappeared by the 12th.

The ice in the Penobscot River at Mattawankeag, Me., went out on the 17th, and the last ice was seen at West Enfield, Me., on the 23d.

The highest and lowest water, mean stage, and monthly range at 309 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*